

SOLICITATION CONTRACT/ORDER FOR COMMERCIAL ITEMS						INITIALS / CONTROL NO.		1. REQUISITION NUMBER		
OFFEROR MUST COMPLETE BLOCKS 12, 17, 23, 24, & 30						RLH 042106		N66604-4023-1AH3		
2. CONTRACT NO.		3. AWARD/EFFECTIVE DATE		4. ORDER NUMBER		5. SOLICITATION NUMBER		6. SOLICITATION ISSUE DATE		
						N66604-04-R-2106		2004 FEB 27		
7. FOR SOLICITATION INFORMATION CALL:		a. NAME		b. TELEPHONE NUMBER (No collect calls)		FAX NUMBER		8. OFFER DUE DATE / LOCAL TIME		
		Richard L. Hall		401-832-1522		401-832-4820		2004 MAR 26 2:00 PM		
9. ISSUED BY CODE N66604 Commercial Acquisition Department, Building 11 Naval Undersea Warfare Center Division, Newport Code 5913, Simonpietri Drive Newport, RI 02841-1708 hallrl@npt.nuwc.navy.mil				10. THIS ACQUISITION IS <input type="checkbox"/> UNRESTRICTED <input type="checkbox"/> SET ASIDE: 100% FOR <input type="checkbox"/> SMALL BUSINESS <input type="checkbox"/> HUBZONE SMALL BUSINESS <input checked="" type="checkbox"/> SOLE SOURCE				11. DELIVERY FOR FOB DESTINATION UNLESS BLOCK IS MARKED <input type="checkbox"/> SEE SCHEDULE <input checked="" type="checkbox"/> X 13a. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 700) 13b. RATING DO-C9		
15. DELIVER TO: CODE N66604 Receiving Officer, Naval Station Newport 47 Chandler Street Newport, RI 02841-1716 401-841-3872 MARK FOR: NUWC Division, Newport -- P.O.# N66604-				NAICS: 336612 SIZE STANDARD 500 empl 16. ADMINISTERED BY CODE SEE BLOCK 9 NO PARTIAL SHIPMENTS OR PAYMENTS ARE AUTHORIZED. DIRECT ALL PAYMENT INQUIRIES TO THE INDIVIDUAL IDENTIFIED ON PAGE 2.				14. METHOD OF SOLICITATION <input type="checkbox"/> RFQ <input type="checkbox"/> IFB <input checked="" type="checkbox"/> RFP		
17a. CONTRACTOR / OFFEROR CAGE CODE Marine Robotic Systems, Inc. 139 Cottage Road Gray, ME 04039-1359 POC/TELE. NO. Joseph Curcio (207) 657-6898 DUNS NUMBER:				18a. PAYMENT WILL BE MADE BY CODE N68892 SUBMIT INVOICES TO: NUWC RECEIPT CONTROL CODE 0221, BUILDING 1176 1176 HOWELL STREET NEWPORT, RI 02841-1708						
<input type="checkbox"/> 17b. CHECK IF REMITTANCE IS DIFFERENT AND PUT ADDRESS IN OFFER				18b. SUBMIT INVOICES TO ADDRESS SHOWN IN BLOCK 18a UNLESS BLOCK IS CHECKED <input type="checkbox"/>				SEE NOTE ABOVE		
19. ITEM NO.		20. SCHEDULE OF SUPPLIES/SERVICES				21. QUANTITY		22. UNIT		
		SEE PAGE 2								
DIST: File(1), Kr (1), 0221 (1), 0221 Rec Control (1), Orig (1)										
25. ACCOUNTING AND APPROPRIATION DATA								26. TOTAL AWARD AMOUNT (For Govt. Use Only)		
<input checked="" type="checkbox"/> 27a. SOLICITATION INCORPORATES BY REFERENCE FAR 52.212-1, 52.212-4. FAR 52.212-3 AND 52.212-5 ARE ATTACHED. ADDENDA <input checked="" type="checkbox"/> ARE <input type="checkbox"/> ARE NOT ATTACHED.										
<input type="checkbox"/> 27b. CONTRACT/PURCHASE ORDER INCORPORATES BY REFERENCE FAR 52.212-4. FAR 52.212-5 IS ATTACHED. ADDENDA <input type="checkbox"/> ARE <input type="checkbox"/> ARE NOT ATTACHED.										
28. CONTRACTOR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN ___ COPIES <input type="checkbox"/> TO ISSUING OFFICE. CONTRACTOR AGREES TO FURNISH AND DELIVER ALL ITEMS SET FORTH OR OTHERWISE IDENTIFIED ABOVE AND ON ANY CONTINUATION SHEETS SUBJECT TO THE TERMS AND CONDITIONS SPECIFIED HEREIN.					29. AWARD OF CONTRACT: REFERENCE _____ OFFER <input type="checkbox"/> DATED _____. YOUR OFFER ON SOLICITATION (BLOCK 5), INCLUDING ANY ADDITIONS OR CHANGES WHICH ARE SET FORTH HEREIN, IS ACCEPTED AS TO ITEMS: ALL ITEMS					
30a. SIGNATURE OF OFFEROR/CONTRACTOR					31a. UNITED STATES OF AMERICA (SIGNATURE OF CONTRACTING OFFICER)					
30b. NAME AND TITLE OF SIGNER (TYPE OR PRINT)					30c. DATE SIGNED		31b. NAME OF CONTRACTING OFFICER(TYPE OR PRINT)		31c. DATE SIGNED	
32a. QUANTITY IN COLUMN 21 HAS BEEN <input type="checkbox"/> RECEIVED <input type="checkbox"/> INSPECTED <input type="checkbox"/> ACCEPTED, AND CONFORMS TO THE CONTRACT EXCEPT AS NOTED: _____										
32b. SIGNATURE OF AUTHORIZED GOVT. REPRESENTATIVE				32c. DATE		32d. PRINTED NAME AND TITLE OF AUTHORIZED GOVT. REPRESENTATIVE				
32e. MAILING ADDRESS OF AUTHORIZED GOVT. REPRESENTATIVE						32f. TELEPHONE NUMBER OF AUTHORIZED GOVT. REPRESENTATIVE				
						32g. E-MAIL OF AUTHORIZED GOVT. REPRESENTATIVE				
33. SHIP. NUMBER		34. VOUCHER NUMBER		35. AMOUNT VERIFIED CORRECT FOR		36. PAYMENT		37. CHECK NUMBER		
<input type="checkbox"/> PARTIAL <input type="checkbox"/> FINAL						<input type="checkbox"/> COMPLETE <input type="checkbox"/> PARTIAL <input type="checkbox"/> FINAL				
38. S/R ACCOUNT NUMBER		39. S/R VOUCHER NUMBER		40. PAID BY						
41a. I CERTIFY THIS ACCOUNT IS CORRECT AND PROPER FOR PAYMENT.					42a. RECEIVED BY (Print)					
41b. SIGNATURE AND TITLE OF CERTIFYING OFFICER					41c. DATE					
					42b. RECEIVED AT (Location)					
					42c. DATE REC'D (YY/MM/DD)					
					42d. TOTAL CONTAINERS					

SCHEDULE CONTINUATION

19. ITEM NO.	20. SCHEDULE OF SUPPLIES/SERVICES	21. QUANTITY	22. UNIT	23. UNIT PRICE	24. AMOUNT
0001	Cooperative Autonomy Research Platform Per specification, Attachment #1	4	EA		
0002	Data per DD form 1423 CDRL, Exhibit "A"	1	JO		

DIRECT ALL PAYMENT INQUIRIES TO:

1. If your company's name begins with "A" through "I", contact Nancy Freeman at 401-832-5953.
2. If your company's name begins with "J" through "Z", contact Martha Heitzenrater at 401-832-5957.
3. The FAX number for Receipt Control is 401-832-3075

THE FOLLOWING CLAUSES ARE APPLICABLE WHEN CHECKED:**DELIVERY SCHEDULE**

(a) The Government requires delivery to be made according to the following schedule:

ITEM NUMBER	QUANTITY	WITHIN DAYS AFTER DATE OF CONTRACT
0001	4	30 SEP 2004

(b) The Government will consider offers that propose earlier delivery than the required delivery schedule. Offers that propose delivery that will not clearly fall within the delivery schedule specified above, will either be considered unacceptable, or a later delivery schedule will be negotiated with all offerors. The Government reserves the right to award under either the required delivery schedule or the proposed delivery schedule. If the offeror proposes no other delivery schedule, the required delivery schedule above will apply.

OFFEROR'S PROPOSED DELIVERY SCHEDULE

ITEM NUMBER	QUANTITY	WITHIN DAYS AFTER DATE OF CONTRACT

X 252.204-7003, CONTROL OF GOVERNMENT PERSONNEL WORK PRODUCT (APR 1992)

X 252.204-7004, REQUIRED CENTRAL CONTRACTOR REGISTRATION (NOV 2001)

X 52.211-5, MATERIAL REQUIREMENTS, (AUG 2000)

X 52.211-15, DEFENSE PRIORITY AND ALLOCATION REQUIREMENTS (SEP 1990)

X 52.211-16, VARIATION IN QUANTITY, (APR 1984)

para.(b) fill-ins:

variation shall be limited to: zero percent increase, and zero percent decrease

variation shall apply to: all items

X 52.213-4, TERMS AND CONDITIONS - SIMPLIFIED ACQUISITIONS (OTHER THAN COMMERCIAL ITEMS) (AUG 2003)

Para. (c) fill-in: <http://www.arinet.gov/far/>

X 52.219-6, NOTICE OF TOTAL SMALL BUSINESS SET-ASIDE (JUN 2003)

X 252.227-7013, RIGHTS IN TECHNICAL DATA -- NON-COMMERCIAL ITEMS, (NOV 1995)

(g) Nothing contained in this clause shall relieve the Contractor from complying with applicable Federal, State, and local laws, codes, ordinances, and regulations (including the obtaining of licenses and permits) in connection with hazardous material.

(h) The Government's rights in data furnished under this contract with respect to hazardous material are as follows:

- (1) To use, duplicate and disclose any data to which this clause is applicable. The purposes of this right are to--
 - (i) Apprise personnel of the hazards to which they may be exposed in using, handling, packaging, transporting, or disposing of hazardous materials;
 - (ii) Obtain medical treatment for those affected by the material; and
 - (iii) Have others use, duplicate, and disclose the data for the Government for these purposes.
- (2) To use, duplicate, and disclose data furnished under this clause, in accordance with subparagraph (h)(1) of this clause, in precedence over any other clause of this contract providing for rights in data.
- (3) The Government is not precluded from using similar or identical data acquired from other sources.

252.223-7001, HAZARD WARNING LABELS (DEC 1991)

(a) "Hazardous material," as used in this clause, is defined in the Hazardous Material Identification and Material Safety Data clause of this contract.

(b) The Contractor shall label the item package (unit container) of any hazardous material to be delivered under this contract in accordance with the Hazard Communication Standard (29 CFR 1910.1200 et seq.). The Standard requires that the hazard warning label conform to the requirements of the standard unless the material is otherwise subject to the labeling requirements of one of the following statutes:

- (1) Federal Insecticide, Fungicide and Rodenticide Act;
- (2) Federal Food, Drug and Cosmetics Act;
- (3) Consumer Product Safety Act;
- (4) Federal Hazardous Substances Act; or
- (5) Federal Alcohol Administration Act.

(c) The Offeror shall list which hazardous material listed in the Hazardous Material Identification and Material Safety Data clause of this contract will be labeled in accordance with one of the Acts in paragraphs (b)(1) through (5) of this clause instead of the Hazard Communication Standard. Any hazardous material not listed will be interpreted to mean that a label is required in accordance with the Hazard Communication Standard.

MATERIAL(If none, insert "None")

ACT

(d) The apparently successful Offeror agrees to submit, before award, a copy of the hazard warning label for all hazardous materials not listed in paragraph (c) of this clause. The Offeror shall submit the label with the Material Safety Data Sheet being furnished under the Hazardous Material Identification and Material Safety Data clause of this contract.

(e) The Contractor shall also comply with MIL-STD-129, Marking for Shipment and Storage (including revisions adopted during the term of this contract).

SOLICITATION PROVISIONS

The following provisions marked with an X apply to this solicitation:

X 52.211-14, NOTICE OF PRIORITY RATING FOR NATIONAL DEFENSE USE (SEP 1990)

___ DX or X DO Rated Order

OFFEROR REPRESENTATIONS AND CERTIFICATIONS.

Complete the information required below and provide a copy with your offer.

CONTRACTOR IDENTIFICATION:

DUNS number is: _____

CAGE code is: _____

Taxpayer Identification Number (TIN) is: _____

X 52.219-1, SMALL BUSINESS PROGRAM REPRESENTATIONS (APR 2002) – ALT I (APR 2002)

(a) (1) The North American Industry Classification System (NAICS) code for this acquisition is set forth on the front page of the solicitation.

(2) The small business size standard is set forth on the front page of the solicitation.

(3) The small business size standard for a concern which submits an offer in its own name, other than on a construction or service contract, but which proposes to furnish a product which it did not itself manufacture, is 500 employees.

(b) Representations.

(1) The offeror represents as part of its offer that it ☐ is, ☐ is not a small business concern.

(2) (Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror represents, for general statistical purposes, that it ☐ is, ☐ is not, a small disadvantaged business concern as defined in 13 CFR 124.1002.

(3) (Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror represents as part of its offer that it ☐ is, ☐ is not a women-owned small business concern.

(4) (Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror represents as part of its offer that it ☐ is, ☐ is not a veteran-owned small business concern.

(5) (Complete only if the offeror represented itself as a veteran-owned small business concern in paragraph (b)(4) of this provision.) The offeror represents as part of its offer that it ☐ is, ☐ is not a service-disabled veteran-owned small business concern.

(6) (Complete only if offeror represented itself as a small business concern in paragraph (b)(1) of this provision.) The offeror represents, as part of its offer, that –

(i) It ☐ is, ☐ is not a HUBZone small business concern listed, on the date of this representation, on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration, and no material change in ownership and control, principal office of ownership, or HUBZone employee percentage has occurred since it was certified by the Small Business Administration in accordance with 13 CFR Part 126; and

(ii) It ☐ is, ☐ is not a joint venture that complies with the requirements of 13 CFR Part 126, and the representation in paragraph (b)(6)(i) of this provision is accurate for the HUBZone small business concern or concerns that are participating in the joint venture. [The offeror shall enter the name or names of the HUBZone small business concern or concerns that are participating in the joint venture: _____.] Each HUBZone small business concern participating in the joint venture shall submit a separate signed copy of the HUBZone representation.

(7) [Complete if offeror represented itself as disadvantaged in paragraph (b)(2) of this provision.] The offeror shall check the category in which its ownership falls:

☐ Black American.

☐ Hispanic American.

☐ Native American (American Indians, Eskimos, Aleuts, or Native Hawaiians).

☐ Asian-Pacific American (persons with origins from Burma, Thailand, Malaysia, Indonesia, Singapore, Brunei, Japan, China, Taiwan, Laos, Cambodia (Kampuchea), Vietnam, Korea, The Philippines, U.S. Trust Territory of the Pacific Islands (Republic of Palau), Republic of the Marshall Islands, Federated States of Micronesia, the Commonwealth of the Northern Mariana Islands, Guam, Samoa, Macao, Hong Kong, Fiji, Tonga, Kiribati, Tuvalu, or Nauru).

☐ Subcontinent Asian (Asian-Indian) American (persons with origins from India, Pakistan, Bangladesh, Sri Lanka, Bhutan, the Maldives Islands, or Nepal).

☐ Individual/concern, other than one of the preceding.

(c) **Definitions.** As used in this provision--

“Service-disabled veteran-owned small business concern” -

(1) Means a small business concern -

(i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and

(ii) The management and daily business operations of which are controlled by one or more service-disabled veterans or, in the case of a veteran with permanent and severe disability, the spouse or permanent caregiver of such veteran.

(2) Service-disabled veteran means a veteran, as defined in 38 U.S.C. 101(2), with a disability that is service-connected, as defined in 38 U.S.C. 101(16).

“Small business concern,” means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria in 13 CFR Part 121 and the size standard in paragraph (a) of this provision.

“Veteran-owned small business concern” means a small business concern -

(1) Not less than 51 percent of which is owned by one or more veterans (as defined at 38 U.S.C. 101(2)) or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more veterans; and

(2) The management and daily business operations of which are controlled by one or more veterans.

“Women-owned small business concern,” means a small business concern--

(1) That is at least 51 percent owned by one or more women or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and

(2) Whose management and daily business operations are controlled by one or more women.

(d) **Notice.**

(1) If this solicitation is for supplies and has been set aside, in whole or in part, for small business concerns, then the clause in this solicitation providing notice of the set-aside contains restrictions on the source of the end items to be furnished.

(2) Under 15 U.S.C. 645(d), any person who misrepresents a firm’s status as a small, HUBZone small, small disadvantaged or women-owned small business concern in order to obtain a contract to be awarded under the preference programs established pursuant to sections 8(a), 8(d), 9, or 15 of the Small Business Act or any other provision of Federal law that specifically references section 8(d) for a definition of program eligibility, shall --

(i) Be punished by imposition of fine, imprisonment, or both;

(ii) Be subject to administrative remedies, including suspension and debarment; and

(iii) Be ineligible for participation in programs conducted under the authority of the Act.

X 52.22-22, PREVIOUS CONTRACTS AND COMPLIANCE REPORTS (FEB 1999)

The offeror represents that -

(a) It ☐ has, ☐ has not participated in a previous contract or subcontract subject either to the Equal Opportunity clause of this solicitation;

(b) It ☐ has, ☐ has not, filed all required compliance reports, and

(c) Representations indicating submission of required compliance reports, signed by proposed subcontractors, will be obtained before subcontract awards.

X 52.22-25, AFFIRMATIVE ACTION COMPLIANCE (APR 1984)

The offeror represents that -

(a) It ☐ has developed and has on file, ☐ has not developed and does not have on file, at each establishment, affirmative action programs required by the rules and regulations of the Secretary of Labor (41 CFR 60-1 and 60-2), or

(b) It ☐ has not previously had contracts subject to the written affirmative action programs requirement of the rules and regulations of the Secretary of Labor.

X 252.225-7000, BUY AMERICAN ACT -- BALANCE OF PAYMENTS PROGRAM CERTIFICATE (APR 2003)

(a) Definitions. "Domestic end product," "foreign end product," "qualifying country," and "qualifying country end product," have the meanings given in the Buy American Act and Balance of Payments Program clause of this solicitation.

(b) Evaluation. The Government-

(1) Will evaluate offers in accordance with the policies and procedures of Part 225 of the Defense Federal Acquisition Regulation Supplement; and

(2) Will evaluate offers of qualifying country end products without regard to the restrictions of the Buy American Act or the Balance of Payments Program.

(c) Certifications and identification of country of origin.

(1) For all line items subject to the Buy American Act and Balance of Payments Program clause of this solicitation, the offeror certifies that--

(i) Each end product, except those listed in paragraph (c)(2) or (3) of this provision, is a domestic end product; and

(ii) Components of unknown origin are considered to have been mined, produced, or manufactured outside the United States or a qualifying country.

(2) The offeror certifies that the following end products are qualifying country end products:

Line Item No.

Country of Origin

(3) The following end products are other foreign end products:

Line Item No.

Country of Origin

CONTRACT DATA REQUIREMENTS LIST

(1 Data Item)

Form Approved
OMB No. 0704-0188

The public reporting burden for this collection of information is estimated to average 220 hours per response, including the time for reviewing instructions searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, (0704-0188) 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to the above address. Send completed form to the Government Issuing Contracting Officer for the Contract/PR No. listed in Block E.

A. CONTRACT LINE ITEM NO. B. EXHIBIT C. CATEGORY:
TDP TM OTHER

D. SYSTEM/ITEM E. CONTRACT/PR NO. F. CONTRACTOR
N66604-4021-1AH3

1. DATA ITEM NO. 2. TITLE OF DATA ITEM 3. SUBTITLE
001 TECHNICAL REPORT-STUDY SERVICES CARP Design Description

4. AUTHORITY (Date Acquisition Document No.) 5. CONTRACT REFERENCE 6. REQUIRING OFFICE
DI-MISC-80508 SOW para. 4 NUWCDIVNPT CODE 221

7. DD 250 REQ 9. DIST STATEMENT REQUIRED 10. FREQUENCY 12. DATE OF FIRST SUBMISSION 14. DISTRIBUTION
LT B 2 TIME 12 APR 04.
8. APP CODE 11. AS OF DATE 13. DATE OF SUBSEQUENT SUBMISSION
30 SEP 04.

16. REMARKS
Final CARP design description. This document shall include all drawings and descriptions of the hardware and software developed for the fabrication of the CARP system
The first submission for review by NUWC Code 221 shall be made NLT 12 APR 04.
After receipt of comments from NUWC and incorporating changes if any.
Final submission to NUWC Code 221 for approval shall be NLT than 30 SEP 04.

15. TOTAL → 1 1

1. DATA ITEM NO. 2. TITLE OF DATA ITEM 3. SUBTITLE

4. AUTHORITY (Date Acquisition Document No.) 5. CONTRACT REFERENCE 6. REQUIRING OFFICE

7. DD 250 REQ 9. DIST STATEMENT REQUIRED 10. FREQUENCY 12. DATE OF FIRST SUBMISSION 14. DISTRIBUTION
8. APP CODE 11. AS OF DATE 13. DATE OF SUBSEQUENT SUBMISSION

16. REMARKS:
LEFT BLANK

G. PREPARED BY: Stephen O'Grady H. DATE: 1/23/04 I. APPROVED BY: A. BROTHERS J. DATE: 1/23/04

DD FORM 1423-1, JUN 90

Previous editions are obsolete

Page of Pages

ENCLOSURE

17. PRICE GROUP

18. ESTIMATED
TOTAL PRICE

Performance Specification

Collaborative Autonomous Research Platform (CARP)

1.0 Scope

The following is a detailed specification for the Collaborative Autonomous Research Platform (CARP) system. The CARP is a lightweight vehicle built upon a kayak platform that will be used to assist in the research and development of autonomous navigation algorithms.

CARPs shall be used in collaborative experiments with the Massachusetts Institute of Technology (MIT) that will require the use of identical platforms. Thus, it is imperative that the Division Newport CARPs be built to the same specification as those vehicles being built for MIT. Subsequently, this performance specification is based strictly on vehicle specification requirements provided by MIT.

2.0 Requirements

2.1 Performance

- 2.1.1 Speed. The CARP shall have a cruising speed of 3 knots in calm water
- 2.1.2 Endurance. The CARP shall be able to maintain a cruising speed of 3 knots for approximately 60 minutes.
- 2.1.3 Maneuverability.
 - 2.1.3.1 The CARP shall be able to move in both the forward and reverse directions.
 - 2.1.3.2 The CARP shall have a turning radius of approximately two boat lengths (~ 8 meters).

2.2 Physical Characteristics

- 2.2.1 Weight. The CARP shall weigh no more than 145 lbs. without battery packs.
- 2.2.2 Handling. The CARP shall have lifting handles at both the fore and aft of the vehicle.
- 2.2.3 Dimensions. The CARP shall be built upon a kayak hull with the following dimensions. These dimensions are shown in Figure 2.1.1
 - 2.2.3.1 Length of no more than 4 meters.
 - 2.2.3.2 Width of no more than 1 meters.
 - 2.2.3.3 Height of no more than 1.25 meters.
- 2.2.4 The CARP hull *shall* be made of a durable impact resistant plastic such as High Density Polyethylene (HDPE) or ABS Plastic.
- 2.2.5 The CARP hull *shall* have watertight bulkheads in both the fore and aft. See items labeled 4 in Figure 2.1.1.
- 2.2.6 The CARP hull *shall* provide access to the fore and aft watertight bulkheads via watertight hatches labeled 2 in Figure 2.1.1. These hatches shall be large enough to access, remove and install the components that shall be mounted in these compartments.
- 2.2.7 The CARP hull *shall* provide access to the central compartment labeled 3 in Figure 2.1.1. The size of this hatch will be based on the size of the main compartment in the kayak hull once selected.
- 2.2.8 The CARP hull shall provide an antenna mast labeled 5 in Figure 2.1.1 to support GPS, RF Modem and Tracking antennas.

Performance Specification Collaborative Autonomous Research Platform (CARP)

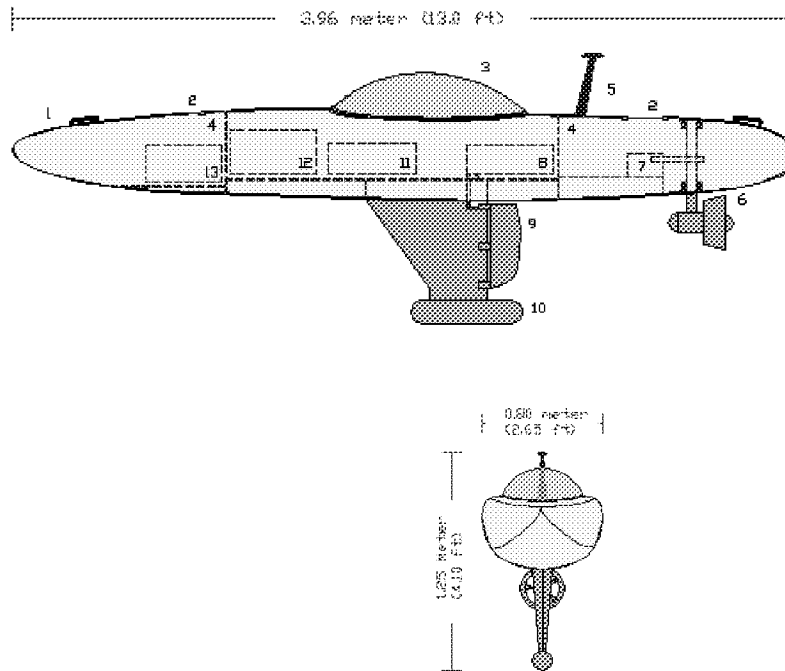


Figure 2.1.1 CARP Dimensions

2.3 Operational Characteristics

2.3.1 Main Vehicle Controller (MVC)

2.3.1.1 The CARP shall have a Main Vehicle Controller (MVC) in the form of a low power single board computer (SBC) or an equivalent to control steering and propulsion actuators.

2.3.1.2 The CARP's MVC shall communicate with actuators control and monitoring computers via standard Ethernet local area network (LAN) connections using standard TCP/IP protocol. These connections are via serial, firewire, USB or equivalent open standard.

2.3.1.3 The CARP's MVC shall run an operating system that will communicate with actuator controllers, on-board navigation components, and battery system.

2.3.1.4 The CARP's on-board navigation components shall include a compass.

2.3.1.5 The CARP's MVC shall be able to boot without human intervention when under normal operations.

2.3.1.6 The CARP's MVC shall possess the hardware interfaces to install a monitor, keyboard and mouse when operating in a debug mode.

2.3.1.7 The CARP's MVC shall have the ability to deduce and report the charge state and consumption rate of the battery system.

2.3.1.8 The CARP's MVC shall regularly monitor and be able to report the status of the battery system, actuator controls, and on-board compass to the NCC.

2.3.1.9 The CARP's MVC shall be able to communicate with the NCC via RJ-45 LAN (Local Area Network) port when the NCC is resident.

2.3.1.10 The CARP's MVC shall be able to communicate with the NCC via 802.11b WLAN (Wireless Local Area Network) when the NCC is not resident.

2.3.1.11 The CARP's MVC shall be able to communicate with the NCC via standard Ethernet local area network (LAN) connections using standard TCP/IP protocol when the NCC is not resident.

2.3.1.12 The CARP's MVC shall regularly perform "watch dog" functions that monitor and report system health and integrity.

Performance Specification Collaborative Autonomous Research Platform (CARP)

- 2.3.2 Navigation and Control Computer (NCC)
 - 2.3.2.1 The user of the CARP shall provide a Navigation and Control Computer (NCC) to direct the navigation actions to the MVC
 - 2.3.2.2 The NCC may operate in a resident mode on-board the CARP, or it may operate in a non-resident mode external to the CARP.
 - 2.3.2.3 The user of the CARP may direct the platform manually using the NCC in a non-resident mode. This remote control configuration would require the user to devise a program or install hardware (i.e. Joystick) to direct RC actions.
- 2.3.3 Battery System
 - 2.3.3.1 The CARP shall contain a battery system that will provide one (1) hour of operation in moderate sea state (surface waves less than 50 cm in height, wind less than 7 knots) at a cruising speed of 3 knots
 - 2.3.3.2 The CARP battery system shall consist of portable battery packs weighing no more than 80 lbs
 - 2.3.3.3 The CARP battery system shall be mounted in water tight housing.
 - 2.3.3.4 The CARP battery system shall be able to be augmented by adding addition battery components to the default configuration.
 - 2.3.3.5 The CARP battery system shall include a battery charger that will allow charging of the vehicle battery while mounted in the vehicle.
 - 2.3.3.6 The CARP battery charger shall operate from a standard 120 V 60 Hz power supply.
- 2.4 Extensibility Requirements
 - 2.4.1 GPS. Provision shall be made to the baseline CARP to support a GPS device that is capable of communicating via serial interface connection.
 - 2.4.2 RF Modem. Provision shall be made to the baseline CARP to support the additional installation of RF Modem into the MVC as to increase the operational range of the vehicle and provide a secondary system for communications between the vehicle and the user supplied NCC.